the desired signal. By placing the sensing coil, which detects the pseudo-Barkhausen signal, in such a manner that it will not inductively couple into the driving coil, the signal-to-noise ratio of the system can be kept very high.

One way to avoid this coupling is to place the sensing coil **40**, which is tuned by capacitor **41** to the desired Barkhausen frequency, around the outside of the crystal platelet device. This arrangement is illustrated in FIG. **6**, wherein it is contemplated that the terminals **42** and **43** will be connected to the sensing amplifier and that appropriate drive circuitry will be provided for the schematically illustrated conductor access loops.

In FIG. **7**, and alternate coil arrangement is shown wherein the sensing circuit **50** is tuned by capacitor **51** and the output line **52** is connected between ground and the sensing amplifier. In this arrangement, coupling to the drive coils is avoided by placing the sensing loops of the conductor **50** symmetrically over the reentrant driving loops so that the two halves of the driving loop cancel each other inductively. For example, the two halves **54** and **55** of a driving conductor at one bit location are surrounded by a sensing loop **56** which is shaped and dimensioned in such manner that the inductively coupled signal from a current in loop **54** is just cancelled by the signal resulting from the same current as it flows through loop **55**. Thus, the coil **56** will be affected only by the changes in magnetic field resulting from the changes in shape of the bubble as it moves between the two positions indicated between the loops of the drive coil and will not be affected by the field of the drive signal itself.

The arrangement shown in FIG. **6** has the advantage that there is less direct coupling to the drive current pulse but it has the disadvantage of loss of sensitivity. The arrangement shown in FIG. **7** has the advantage of higher sensitivity, but it requires exact juxtapositioning and very precise form and dimension control for both the drive circuit loops and the sensing coil loops to avoid coupling of the drive current pulses into the sensing circuit in inductive imbalance.

There has thus been described a means for attaining a uniform coercivity control in a crystal platelet which coercivity is sufficiently large to mask out coercivity variations in the platelet itself and which at the same time affords important advantages such as a more stable bubble pattern which can be switched at higher rates and which is less susceptible to ambient temperature variation and which can be detected by a sensing means not heretofore available.

What is claimed is:

1. In a digital signal translating device of the type having at least one uniaxially anisotropic ferromagnetic crystal platelet having its major plane surface cut perpendicularly to the easy axis of magnetization of said crystal and being capable in the presence of an externally applied magnetic biasing field of sustaining movable cylindrical magnetic domains having their cylindrical axes lying along said easy axis of magnetization, means to apply said magnetic biasing field to said crystal, and conductor access array means to control the positions of said movable domains in said platelet comprising magnetic field generating conductor means to define an array of cylindrical domain retaining positions in said crystal, the improvement comprising:

a two-dimensional lattice array of dots of magnetically susceptible material in intimate physical contact with said major plane surface of said crystal platelet, said material of said dots having a higher permeability than that of said crystal platelet and said array extending over a predetermined area comprising the entire portion of the plane of said major plane surface of said crystal platelet which is to be positioned adjacent said access conductor array means:

each of said dots having a maximum dimension in said plane which is no greater than one-fifth of the minimum diameter of the cylindrical domains which can be sustained in said platelet and each of said dots having a center-to-center spacing from the nearest other dot in said array which is less than one-half said minimum diameter, said center-to-center spacing being uniform between all dots lying on a straight line drawn through any two dots to form a symmetrical array having no predetermined alignment relationship with any individual conductor of said conductor access array but extending uniformly and symmetrically over said entire predetermined area adjacent said conductor access array;

said dots forming in said predetermined area an orderly array positioned to provide a predetermined localized coercivity in said predetermined area of said crystal platelet; and

means to detect the motion of said cylindrical magnetic domains in said crystal, said means comprising means inductively coupled to said platelet to detect the motion of field of at least one of said magnetic domains, said inductively coupled means being tuned to resonance at a frequency equal to the frequency at which said magnetic domain is expanded and contracted by said array of dots when said cylindrical domain is moved by a predetermined drive field resulting from a current applied to said conductor access means.

2. A device as in claim **1** wherein said crystal platelet is an orthoferrite and each of said dots is formed of "Permalloy" material.

3. A device as in claim **1** wherein said array of dots is usable, orthogonal array of uniformly shaped and uniformly dimensioned dots.

4. A device as in claim **1** wherein said array of dots is a uniformly shaped and uniformly dimensioned orthogonal array of dots equally spaced along both orthogonal axes.

5. A device as in claim **1** wherein said array of dots has differential spacing in different directions of said array to provide a direction of maximum mobility.

6. A device as in claim **1** wherein said inductively coupled means is a conductor loop surrounding said entire platelet.

7. A device as in claim **1** wherein said inductively coupled means is a plurality of conductor loops, each of which surrounds one of said domain retaining positions in said crystal.

8. In combination:

a. a detection signal generating symmetrical pattern of dots of magnetically susceptible material deposited on a major plane surface of a uniaxially ferromagnetic crystal platelet capable of sustaining movable cylindrical magnetic domains therein; and

b. detector means inductively coupled to said platelet to detect the motion of the field of at least one of said magnetic domains when said domain moves past said detector means, said means being tuned to resonance at a frequency equal to the frequency at which said magnetic domain is expanded and contracted by the latching and unlatching of said one moving domain by said signal generating pattern of dots when said domain is moved past said detector at a predetermined velocity.

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